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学位論文題目	Study on Mobile Application for Earthquake Education Targeting Foreigners Intending to Visit Japan （訪日外国人を対象とした地震防災教育モバイルアプリに関する研究）

内容要旨

Japan is a country prone to various natural disasters. Strong earthquakes and possible resulting tsunamis are the most dangerous natural disasters in terms of unpredictability and destructiveness. Japan is exactly located in the Pacific Rim seismic belt, making it susceptible to strong earthquakes and tsunamis.

Surviving a strong earthquake depends on people's preparation and behavior. People must acquire sufficient knowledge and skills to survive the next possible devastating earthquake. By receiving earthquake education, individuals can improve their survivability in strong earthquakes. Earthquake education teaches people how to prepare before earthquakes, and properly react when a destructive earthquake hits, as well as how to cope with the aftermath.

This study focused on earthquake education for foreigners. With over 2.76 million foreigners currently living in Japan and a massive number of tourists each year, some never experienced earthquakes or know little about how to survive strong earthquakes. Such people may be in trouble if a strong earthquake occurs. Thus, earthquake education for foreigners living in or planning to visit Japan is critical.

This study focused on how to improve the earthquake education situation of foreigners to increase their survivability in severe earthquakes in Japan. This study's target audience is foreigners planning to visit Japan, who should begin receiving earthquake education in their own country before arriving in Japan. Getting earthquake education in advance will strive for more learning time. Foreigners are expected to build awareness of the earthquake crisis and gain more opportunities to master the knowledge of earthquake survival and build confidence in surviving earthquakes in Japan. To achieve this goal, we proposed a learning model called "FOE+G." FOE means the Frequency of Occurrence of Earthquakes in Japan and is considered in this study as a type of arousal mechanism that enables the target audience to be exposed to seismic information while triggering learning opportunities. G means gamification, which makes earthquake education more engaging and encourages foreigners to continue learning earthquake survival knowledge that they may ignore.

Based on the "FOE+G" learning model, a prototype system in the form of a cross-platform application was developed to validate that the learning model improves earthquake education for the target audience. Every time an eligible earthquake occurs in Japan, the application sends seismic information notifications to the target group. The high frequency of earthquakes in Japan enables users to be fully exposed to earthquake hazard information, which helps in the development of earthquake awareness. A good earthquake awareness encourages the target audience to better understand the importance of earthquake education and to participate more actively in it. Simultaneously, knowledge tips are attached to each earthquake notification, thereby creating a learning opportunity while understanding the details of the earthquake. In addition, gamification is used in this study. The application of game elements, such as points, badges, and daily attendance, as well as game mechanics, such as reward mechanics, challenge mechanics, achievement, and mechanics, are expected to make earthquake education more engaging and motivate users to learn.

An experiment revealed that the prototype system helped the target group in improving the earthquake education situation. The FOE worked to improve learning performance and master basic theoretical earthquake knowledge and skills, as well as increase participation and earthquake awareness to some extent. Gamification worked little on building earthquake awareness, but it did keep individuals motivated to learn for a longer period and improve learning performance. Overall, the learning model "FOE+G" and the related prototype system achieved the expected research goals.